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REMARKS

Claims 1-20 are in the case. Claims 1-2, 6, 11-12, 17, and 19-20 are rejected under 35 USC § 102 over USAN 2002/0035435 to Ninomiya et al. and also under 35 USC § 103 over USPN 6,701,259 to Dor et al. Claims 3-5 are rejected under 35 USC § 103 over Ninomiya et al. in view of USPN 5,502,306 to Meisburger et al. Claims 7-10, 13-16, and 18 are rejected under 35 USC § 103 over Ninomiya et al. in view of USPN 6,167,150 to Michael et al. Claim 11 has been amended. The rejections are respectfully traversed. Reconsideration and allowance of the claims are respectfully requested.

PRELIMINARY COMMENTS ON REJECTIONS

The office action states that “extended objects is so broad and corresponds to other defect.” However, applicants have defined the term “extended objects” in the specification, page 7, lines 14-15, which reads “extended objects are patterns of individual defects, such as clusters or signatures.” Thus, the term “extended objects” has a meaning and is not unlimited in meaning as the statement in the office action might be used to imply. By the provided definition, “extended objects” are patterns of defects. Thus, two components are required for something to be an “extended object.” First, it must comprise a pattern, and second, the pattern must be formed of defects, not something else. With this definition in mind, the differences between the invention as claimed and the prior art is more understandable, as described in greater detail hereafter.

CLAIM REJECTIONS UNDER §102

Claims 1-2, 6, 11-12, 17, and 19-20 are rejected under 35 U.S.C. 102 as being unpatentable over Ninomiya et al. Independent claim 1 claims, *inter alia*, a method for analyzing defects on a substrate by inspecting the substrate to detect the *defects*, identifying the defects by *location*, analyzing the defects to detect *extended objects*, and analyzing the *extended objects for repetition* across the substrate.

Ninomiya et al. do not describe such a process. First, Ninomiya et al. do not look for extended objects within the defects. The office action states that Ninomiya et al. describe analyzing the extended objects for repetition in paragraph 77. However,

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Ninomiya et al. do not ever look for extended objects, as the term is defined in the present application (remembering that "extended objects" are patterns of defects). Ninomiya et al. do not at any point state that the patterns that are used in their process are patterns of defects. In fact, it is apparent from the description of the patterns that the patterns comprise the integrated circuitry itself, and not patterns of defects.

In regard to this issue, the office action states that "since each repeated pattern on each die is to be inspected compared to a threshold, repeated defects may be found." Applicants have several comments in regard to this statement, each of which is sufficient to remove this as a valid argument against patentability of the present invention as claimed. First, as mentioned above, the patterns of Ninomiya et al. are patterns of integrated circuits, not patterns of defects. Second, Ninomiya et al. do not describe inspecting each repeated pattern on each die. The repeating patterns are used as positional references so that a defect that is detected on an inspection system can be located on a separate observation system. Third, even if this system enabled the possible finding of repeated defects (which it doesn't), the mere fact that the system *enabled* such a capability is not the same as the reference actually *describing* such a method step. For this reference to work as a bar to patentability of the present invention as claimed, *the reference has to actually describe* all the steps, not just describe a system that would make the steps possible to accomplish. And Ninomiya et al. do not describe searching for repeating extended objects.

Thus, claim 1 patentably defines over Ninomiya et al. Reconsideration and allowance of claim 1 are respectfully requested. Dependent claims 2 and 6 depend from independent claim 1, and contain additional important aspects of the invention. Therefore, dependent claims 2 and 6 patentably define over Ninomiya et al. Reconsideration and allowance of dependent claims 2 and 6 are respectfully requested.

Similar to that as described above in regard to claim 1, claim 11 claims, *inter alia*, a method for analyzing defects on a semiconductor substrate, by optically inspecting the substrate to detect the *defects*, identifying the defects by *location*, analyzing the defects to detect *extended objects*, and analyzing the *extended objects for repetition* across the substrate.

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The deficiencies of Ninomiya et al. in regard to this combination of elements are described above. Thus, claim 11 patentably defines over Ninomiya et al. Reconsideration and allowance of claim 11 are respectfully requested. Dependent claim 12 depends from independent claim 11, and contains additional important aspects of the invention. Therefore, dependent claim 12 patentably defines over Ninomiya et al. Reconsideration and allowance of dependent claim 12 are respectfully requested.

Similar to that as described above in regard to claims 1 and 11, claim 17 claims, *inter alia*, an apparatus for analyzing defects on a substrate, with a sensor for inspecting the substrate, a stage for providing relative movement, and a controller for correlating *defect information* and *position information*, analyzing the correlated defect information and position information to detect *extended objects*, and *analyzing the extended objects for repetition* across the substrate.

The deficiencies of Ninomiya et al. in regard to this combination of elements are described above. Thus, claim 17 patentably defines over Ninomiya et al. Reconsideration and allowance of claim 17 are respectfully requested. Dependent claims 19-20 depend from independent claim 17, and contain additional important aspects of the invention. Therefore, dependent claims 19-20 patentably define over Ninomiya et al. Reconsideration and allowance of dependent claims 19-20 are respectfully requested.

CLAIM REJECTIONS UNDER §103

Claims 1-2, 6, 11-12, 17, and 19-20 are rejected under 35 U.S.C. 103 as being unpatentable over Dor et al. Independent claim 1 claims, *inter alia*, a method for analyzing defects on a substrate by inspecting the substrate to detect the *defects*, identifying the defects by *location*, analyzing the defects to detect *extended objects*, and analyzing the *extended objects for repetition* across the substrate.

Dor et al. do not describe such a process, in that Dor et al. do not look for repeating extended objects across a substrate. As mentioned above, "extended objects" are things such as clusters and signatures. Dor et al. have a selectable mode to perform calculations to identify clusters of defects and spatial signature analysis on the substrate. However, Dor et al. do not at any point describe looking for repeating clusters or signatures on the substrate. This claimed step is completely omitted from the method of

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Dor et al. Although it might have been possible for Dor et al. to have looked for repeating extended objects, they do not at any point describe doing such. Therefore, Dor et al. is deficient, and claim 1 is patentable over Dor et al. Claims 2 and 6 depend from independent claim 1, and contain additional important aspects of the invention. Reconsideration and allowance of claims 1-2 and 6 are respectfully requested.

Similar to that as described above in regard to claim 1, claim 11 claims, *inter alia*, a method for analyzing defects on a semiconductor substrate, by optically inspecting the substrate to detect the *defects*, identifying the defects by *location*, analyzing the defects to detect *extended objects*, and analyzing the *extended objects for repetition* across the substrate.

The deficiencies of Dor et al. in regard to this combination of elements are described above. Thus, claim 11 patentably defines over Dor et al. Reconsideration and allowance of claim 11 are respectfully requested. Dependent claim 12 depends from independent claim 11, and contains additional important aspects of the invention. Therefore, dependent claim 12 patentably defines over Dor et al. Reconsideration and allowance of dependent claim 12 are respectfully requested.

Similar to that as described above in regard to claims 1 and 11, claim 17 claims, *inter alia*, an apparatus for analyzing defects on a substrate, with a sensor for inspecting the substrate, a stage for providing relative movement, and a controller for correlating *defect information* and *position information*, analyzing the correlated defect information and position information to detect *extended objects*, and *analyzing the extended objects for repetition* across the substrate.

The deficiencies of Dor et al. in regard to this combination of elements are described above. Thus, claim 17 patentably defines over Dor et al. Reconsideration and allowance of claim 17 are respectfully requested. Dependent claims 19-20 depend from independent claim 17, and contain additional important aspects of the invention. Therefore, dependent claims 19-20 patentably define over Dor et al. Reconsideration and allowance of dependent claims 19-20 are respectfully requested.

Claims 3-5 are rejected under 35 USC § 103 over Ninomiya et al. in view of Meisburger et al. Dependent claims 3-5 depend from independent claim 1, and therefore claim *inter alia*, a method for analyzing defects on a substrate by inspecting the substrate

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to detect the *defects*, identifying the defects by *location*, analyzing the defects to detect *extended objects*, and analyzing the *extended objects for repetition* across the substrate.

The deficiencies of Ninomiya et al. in regard to this combination of elements are described at length above. Meisburger et al. do not compensate for the deficiencies of Ninomiya et al., in that Meisburger et al. also do not describe either one of analyzing defects to detect extended objects or analyzing the extended objects for repetition. Thus, claims 3-5 patentably define over Ninomiya et al. in view of Meisburger et al. Reconsideration and allowance of claims 3-5 are respectfully requested.

Claims 7-10, 13-16, and 18 are rejected under 35 USC § 103 over Ninomiya et al. in view of Michael et al. Dependent claims 7-10 depend from independent claim 1, and therefore claim *inter alia*, a method for analyzing defects on a substrate by inspecting the substrate to detect the *defects*, identifying the defects by *location*, analyzing the defects to detect *extended objects*, and analyzing the *extended objects for repetition* across the substrate.

The deficiencies of Ninomiya et al. in regard to this combination of elements are described at length above. Michael et al. do not compensate for the deficiencies of Ninomiya et al., in that Michael et al. also do not describe either one of analyzing defects to detect extended objects or analyzing the extended objects for repetition. Michael et al. describe a "bounding box," but the term is again used in a different context from that as used in the present claims and described in the present application. Michael et al. describe using a "bounding box" to determine the edge of an object of interest, and if there are other objects adjacent the edge of the bounding box of the object of interest, then it is classified as a defect. However, no extended objects are found within the defects, as recited by the present claims, and no repetition of extended objects is looked for. Thus, claims 7-10 patentably define over Ninomiya et al. in view of Michael et al. Reconsideration and allowance of claims 7-10 are respectfully requested.

Similar to that as described above in regard to claims 7-10, dependent claims 13-16 depend from independent claim 11, and therefore claim *inter alia*, a method for analyzing defects on a semiconductor substrate, by optically inspecting the substrate to detect the *defects*, identifying the defects by *location*, analyzing the defects to detect *extended objects*, and analyzing the *extended objects for repetition*.

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The deficiencies of Ninomiya et al. in regard to this combination of elements are described at length above. Michael et al. do not compensate for the deficiencies of Ninomiya et al., in that Michael et al. also do not describe either one of analyzing defects to detect extended objects or analyzing the extended objects for repetition. Thus, claims 13-16 patentably define over Ninomiya et al. in view of Michael et al. Reconsideration and allowance of claims 13-16 are respectfully requested.

Similar to that as described above in regard to claims 7-10 and 13-16, dependent claim 18 depends from independent claim 17, and therefore claims *inter alia*, an apparatus for analyzing defects on a substrate, with a sensor for inspecting the substrate, a stage for providing relative movement, and a controller for correlating *defect information* and *position information*, analyzing the correlated defect information and position information to detect *extended objects*, and *analyzing the extended objects for repetition* across the substrate.

The deficiencies of Ninomiya et al. in regard to this combination of elements are described at length above. Michael et al. do not compensate for the deficiencies of Ninomiya et al., in that Michael et al. also do not describe either one of analyzing defects to detect extended objects or analyzing the extended objects for repetition. Thus, claim 18 patentably defines over Ninomiya et al. in view of Michael et al. Reconsideration and allowance of claim 18 are respectfully requested.

COMBINATION OF REFERENCES

Applicants submit that the office action cites references in which certain key words have been found, which key words are similar to the words that are used in the claims of the present application, but these key words do not in all cases even match the concepts that are expressed in the present claims. Further, there is no permissible incentive to make the combinations of the cited references in the manner expressed in the office action. However, even if such a combination could be permissibly made, the present invention as claimed is still not made obvious by the cited combination, because the concepts of the matched key words do not align with the concepts expressed in the claims.

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CONCLUSION

Applicants assert that the claims of the present application patentably define over the prior art made of record and not relied upon for the same reasons as given above. Applicants respectfully submit that a full and complete response to the office action is provided herein, and that the application is now fully in condition for allowance. Action in accordance therewith is respectfully requested.

In the event this response is not timely filed, applicants hereby petition for the appropriate extension of time and request that the fee for the extension be charged to deposit account 12-2355. If other fees are required by this amendment, such as fees for additional claims, such fees may be charged to deposit account 12-2252. Should the examiner require further clarification of the invention, it is requested that s/he contact the undersigned before issuing the next office action.

Sincerely,

LUEDEKA, NEELY & GRAHAM, P.C.

By: 

Rick Barnes, 39,596

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